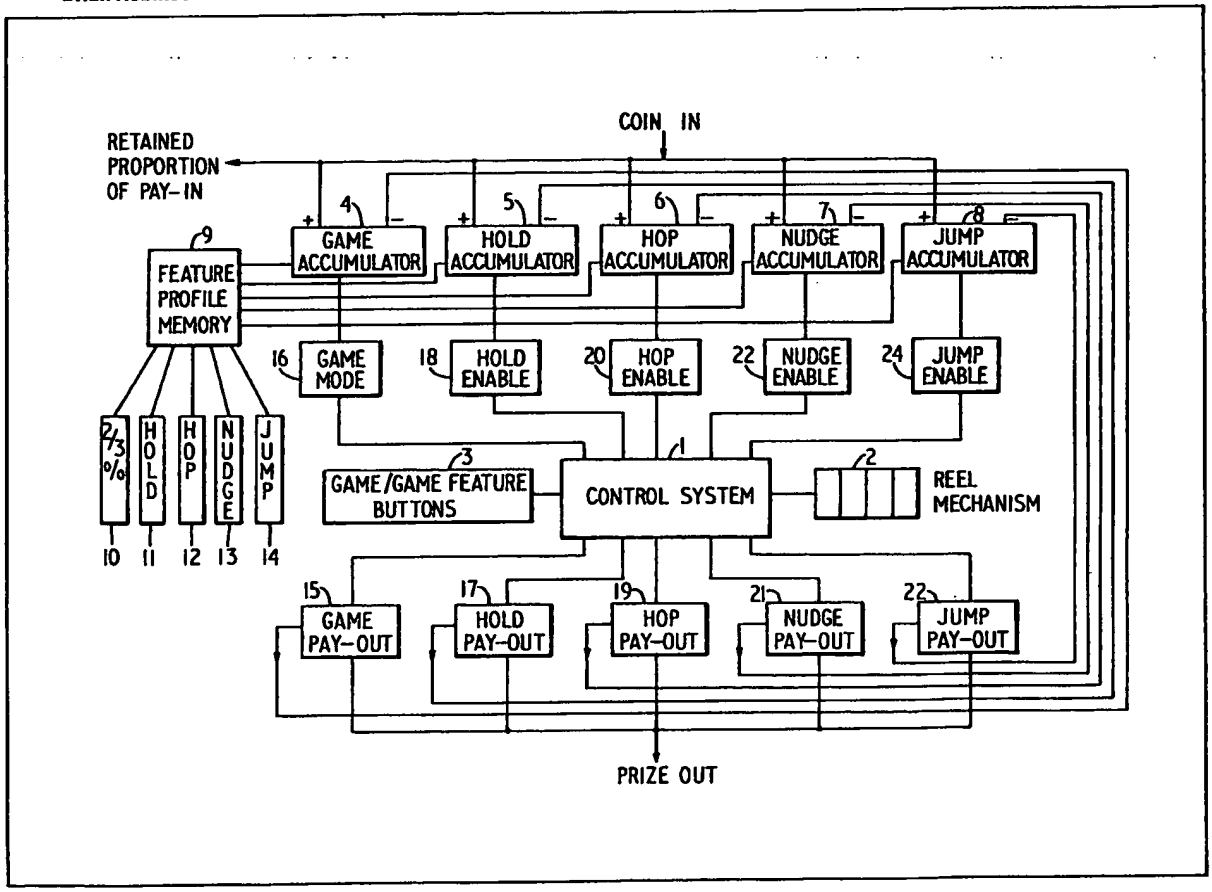
(12) UK Patent Application (19) GB (11) 2 097 570 A

(21) Application No 8209618
(22) Date of filing 1 Apr 1982
(30) Priority data
(31) 8110373
(32) 2 Apr 1981
(33) United Kingdom (GB)
(43) Application published
3 Nov 1982
(51) INT CL³
G07F 17/34
(52) Domestic classification
G4V 118 AA
(56) Documents cited
GB 1424775
GB 1235651
GB A 2087618
GB 1591001
(58) Field of search
G4V

(71) Applicants
Questenco Limited,
Cobellon House,
Inkpen Road,
Kintbury,
Berkshire.
(72) Inventors
Richard Ian Sharpe,
Brian Robinson Kirk.
(74) Agents
Arthur R. Davies,
27 Imperial Square,
Cheltenham.

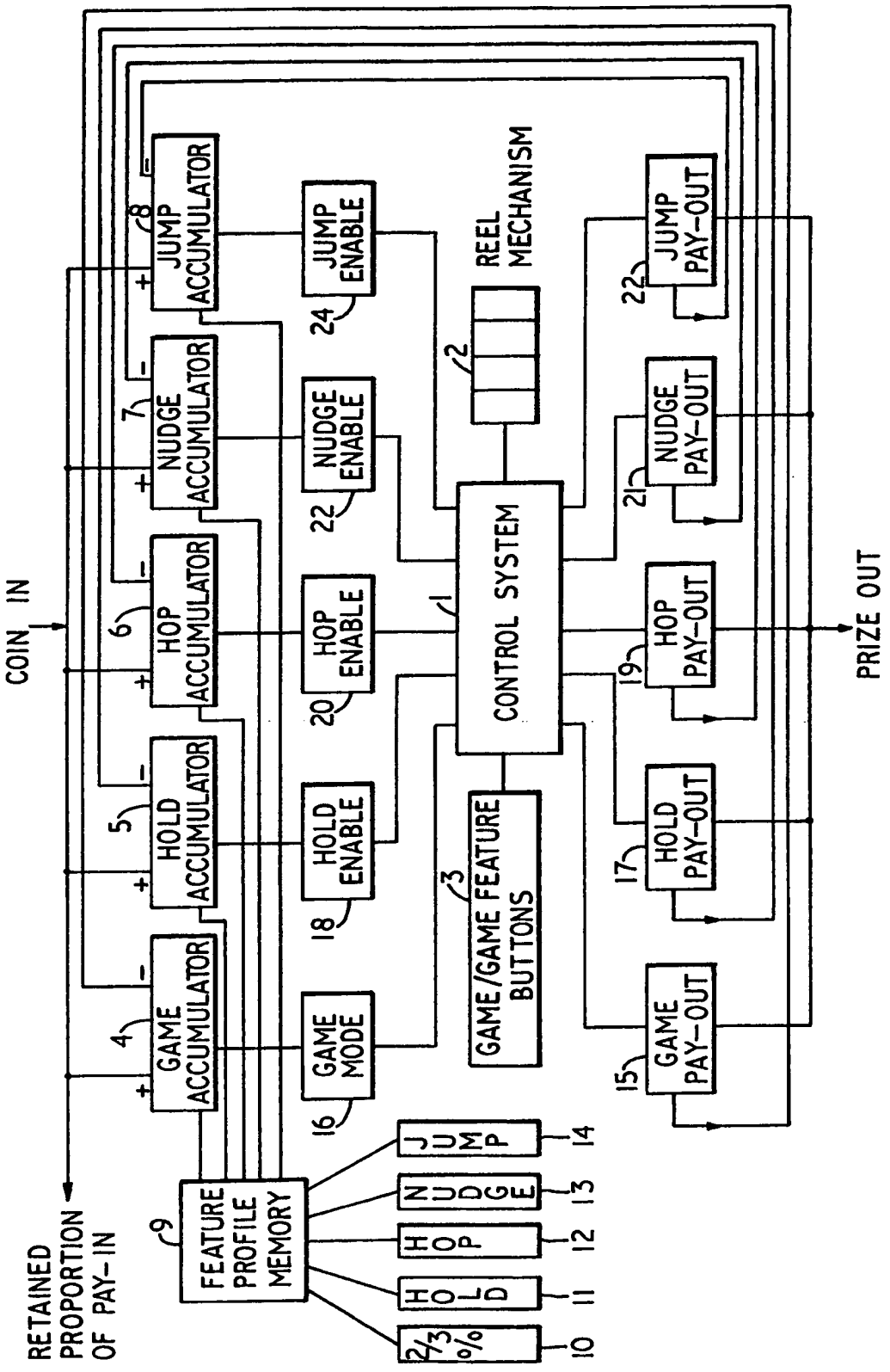
(54) **Gaming machines**

(57) A fruit machine comprises a control system 1 which controls a reel mechanism 2 in dependence on depression of game/game-feature buttons 3. When a coin is introduced into the machine a certain predetermined proportion of the value of the coin is credited to each of a game accumulator 4, a hold accumulator 5, a hop accumulator 6, a nudge accumulator 7 and a jump accumulator 8. When a winning combination is obtained on the reel mechanism 2 as a result of a normal game, the value of the prize awarded is subtracted from the game accumulator 6, whereas, when a winning combination is obtained as a result of a hold, hop, nudge or jump game feature, the value of the prize is subtracted from the appropriate one of the accumulators 5 to 8. If the value in the game accumulator 4 becomes negative the control system 1 goes into a low pay-out mode, whereas, if the value in one of the accumulators 5 to 8 becomes negative, the corresponding game feature is not made available to the player. This ensures accurate control over the pay-out associated with the game and each of the game features and enables the various pay-outs to be separately adjusted.



GB 2 097 570 A

The drawing originally filed was informal and the print here reproduced is taken from a later filed formal copy.


COIN IN
RETAINED PROPORTION OF PAY-IN
PRIZE OUT
CONTROL SYSTEM
REEL MECHANISM
GAME/GAME FEATURE BUTTONS
FEATURE PROFILE MEMORY
GAME ACCUMULATOR
HOLD ACCUMULATOR
HOP ACCUMULATOR
NUDGE ACCUMULATOR
JUMP ACCUMULATOR
GAME MODE
HOLD ENABLE
HOP ENABLE
NUDGE ENABLE
JUMP ENABLE
GAME PAY-OUT
HOLD PAY-OUT
HOP PAY-OUT
NUDGE PAY-OUT
JUMP PAY-OUT
2/3 %
HOLD
HOP
NUDGE
JUMP
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
24

SPECIFICATION

Gaming machines

This invention relates to gaming macines, such as those known as "fruit machines".

Fruit machines conventionally incorporate three or more rotary members, such as reels or strips, disposed side-by-side and bearing symbols viewable in a viewing zone, or a representation of such rotary members, referred to hereafter as "quasi-rotary members", on a video or projection screen. The symbols generally represent various fruits, although it will be understood that the term "fruit machine" may be applied to machines having rotary members bearing symbols other than fruits. During a game the rotary members are spun or appear to be spun in response to actuation of a game-initiating button by a player after a coin, token or credit has been paid into the machine, and the rotary members subsequently come to rest in random positions indicated by a combination of symbols in the viewing zone. Alternatively the machine may c mprise display units, such as an array of lights, adapted to display the symbols, and means for cyclically changing the symbols displayed by the units. The combination of symbols visible in the viewing zone is then compared with a number of prize-winning combinations, and a prize is awarded if a match is found. In addition to the normal game a number of game features, such as "hold" and "nudge", may be made available to the player by such machines in order to increase the chances of obtaining a prize.

The distribution of symbols on each of the rotary members, the number of winning combinations, the distribution of prizes of different values amongst the various winning combinations and the relative availability of the various game features must be carefully controlled to obtain the required pay-out structure, that is the desired pay-out rate or "odds", the relative pay-out of the game and the various game features, and the optimum distribution of prizes. However, different "odds" are required for different applications, and it may be desirable to change the "odds" of a machine and/or possibly to change the relative pay-out of the various game features, to improve player appeal for example. In addition it is usual to provide more prizes of higher value in the case of machines which are installed in club premises. With known machines it is difficult to check for correct "odds" and to tune a macine to a change in "odds". It is an object of the invention to provide a machine in which the pay-out structure and the interaction of all machine variables is easily modified to suit particular requirements.

According to the invention, there is provided a gaming machine comprising game-playing apparatus, accumulator means for storing a current credit value associated with a game or game feature, pay-in means for monitoring the value of the pay-in and incrementing the current credit value in the accumulator means by a predetermined proportion, but not the whole, of the pay-in value, pay-out means for awarding a prize in the event of a winning result to the game or game feature and for decrementing the current credit value in the accumulator means by at least a part of the value of the prize awarded, and control means for controlling the game-playing apparatus in dependence on the current credit value in the accumulator means.

In a preferred form of the invention the accumulator means comprises a plurality of accumulators each of which stores a current credit value associated with a respective game or game feature, the pay-in means serving to increment the current credit values in the accumulators by predetermined proportions of the pay-in value such that the sum of the proportions allotted to the accumulators is less than the whole of the pay-in value, and the pay-out means serving to decrement the current credit value associated with the game or game feature in connection with which the prize is awarded by at least a part of the value of the prize awarded, and the control means is arranged to control the game-playing apparatus in dependence on the current credit values in the accumulators.

Where such an arrangement is applied to a fruit machine and a separate accumulator is associated with the game and each of a plurality of game features, it will be appreciated that the amount paid out by the game or a particular game feature over the long term will be determined by the current credit value in the associated accumulator from which the pay-out is to be made so that the pay-out structure is determined inh rently by the predetermined proportions of the pay-in allotted to the different accumulators. Any one of a number of short-term pay-out strategies may be adopted in the machine as the long-term pay-out structure of the machine is defined by the proportions initially selected for each of the accumulators.

In order to tune the machine to a change in odds all that is necessary is to change the proportions allotted to the various accumulators, and in this manner the overall pay-out of the machine may be altered or the pay-out of a particular game feature may be increased or decreased relative to the pay-out associated with the oth r gam features. In addition a degree of fine tuning may be provided by a plurality of switches each of which is associated with a r spective game featur and may be operated t adjust the proportion of the pay-in value allotted to that feature. This nables the propriet r of the machine to vary the pay-out structure of the machine to tailor it mor closely to the requirements of his customers.

In order that th invention may be m r fully underst od, a fruit machine in accordanc with the inv ntion will now b described, by way of example, with reference to the accompanying drawing, in which th singl Figur shows a block diagram f th machine.

The illustrated machine includes a control syst m 1 which inc rporates a microprocessor and is of th type described in Patent Specificati n No. 1,550,732. This c ntr l syst m 1 controls a reel mechanism 2 comprising four reels in dependence on depression of game/game-feature buttons 3 by the player. Wh n a c in or tok n is introduced into the machine and a game-initiating button is depressed by th play r, the

reels of the reel mechanism 2 are caused to be spun by the control system 1 with the reels coming to rest one at a time and in a particular order in accordance with the usual convention. Each reel is driven by the appropriate amount by a respective drive signal supplied by the control system 1, these drive signals being determined entirely randomly consistent with the reels coming to rest in the required order, and the combination of symbols on the combination line when the reels have stopped is computed directly from the drive signals and compared with the possible prize-winning combinations. In the event of a match a prize is awarded. The machine also incorporates five separate game features, termed "hold", "hop", "nudge", "jump" and "gamble", which may be awarded after a main game has been played and which offer a further chance of winning a prize.

For each 10p coin, token or credit which is introduced into the machine by the player a certain predetermined proportion of this amount is credited to each of a game accumulator 4, a hold accumulator 5, a hop accumulator 6, a nudge accumulator 7 and a jump accumulator 8. The relative proportions allotted to the accumulators 4 to 8 are determined by a percentage pay-out table stored in a feature profile memory 9 and may, for example, be as follows:

Game/Feature	*Pay-Out %*	*Pence per 10p Credit*
Game	29	2.9p
Hold	5	0.5p
Hop	15	1.5p
Nudge	12	1.2p
Jump	15	1.5p
	76	7.6p

The amounts credited to the accumulators 4 to 8 are intended to be paid out by the machine in the form of prizes awarded in connection with the corresponding game/game features, and the balance of the amount credited, that is 2.4p per 10p credit in the case of the particular example given, is retained by the machine. The pay-out structure of the machine may be changed so as to increase the percentage pay-out associated with any of the four game features by either 2% or 3% by operating a digiswitch 10 to determine whether the increase is to be by 2% or 3% and a further digiswitch 11, 12, 13 or 14 to determine the game feature with which this increase is to be associated. Thus, if the percentage pay-out associated with each game feature is increased by 3% by operating all the digiswitches 10 to 14, a total percentage pay-out of 88% corresponding to 8.8p per 10p credit is obtainable. These digiswitches may therefore be used not only for fine control of the feature profile but also so as to increase the total percentage pay-out.

As long as the game accumulator 4 is in credit the result of a game played on the machine is determined in the normal manner, and, in the event of a winning result to the game, a prize is awarded and the appropriate amount is subtracted from the game accumulator 4 by a game pay-out unit 15. However, if the value within the game accumulator 4 becomes negative, then a game mode control 16 is caused to go into a low pay-out mode in which the reel mechanism 2 is controlled by the control system 1 such that certain high value prizes are no longer awarded as a result of a game played while the control 16 is in this mode.

If the hold accumulator 5 is in credit a hold feature may be offered to the player after a game has been played, even if a winning result to that game was obtained. If a prize is awarded as a result of the subsequent hold game, then the appropriate amount is subtracted from the hold accumulator 5 by a hold pay-out unit 17, rather than from the game accumulator 4. However, if the amount within the hold accumulator 5 becomes negative, then a hold enable control 18 prevents a hold feature from being awarded to the player until the hold accumulator 5 is again in credit. Whether or not a hold feature is to be awarded, when it is available, is determined on a random basis with a chance of 1 in 4, for example, of the feature being offered so as to give the effect of spreading the award of the feature in time and preventing it becoming predictable.

If the hop accumulator 6 is in credit a hop feature may be offered in dependence on the result of the preceding game, and, in the event of a prize being awarded, the appropriate amount is subtracted from the hop accumulator 6 by a hop pay-out unit 19. The award of a hop feature is prevented by a hop enable control 20 when the amount in the hop accumulator 6 becomes negative. Similarly the availability of a nudge feature is controlled by a nudge pay-out unit 21 and a nudge enable control 22, and the availability of a jump feature is controlled by a jump pay-out unit 23 and a jump enable control 24. Whether or not these further game features are offered when available is also determined randomly with a chance of 1 in 3 in the case of the hop and jump features and a chance of 1 in 5 in the case of the nudge feature. An order of priority is assigned to the game features so that only one game feature is awarded at a time even though more than one game feature may be available to be selected.

A gamble feature may also be made available on a random basis after a game or game feature has been played, and, in the event of a prize being awarded as a result of a gamble, the total value of the prize is subtracted from the accumulator associated with the game or game feature which immediately preceded the gamble.

In a modification of the above described machine the five digiswitches 10 to 14 are replaced by eight

digiswitches comprising two switches associated with each of the four game-feature accumulators 5 to 8. The four possible positions of two switches associated with a particular feature represent an increase in the percentage pay-out associated with that feature of respectively 0%, 1%, 2% and 3%, and therefore provide for finer adjustability of the feature profile.

It would be possible to provide such machines with adjustment means for automatically varying the desired pay-out structure in use. The adjustment means may be adapted to suit the pay-out structure to the player who is playing the machine. For example, if the machine senses that a player never makes use of a "hold" facility, the desired pay-out structure may be temporarily adjusted to provide a higher proportion of small value wins. Alternatively the adjustment means may be adapted to vary the pay-out structure in accordance with time or number of games played, for example so as to increase the proportion of small value wins at the beginning of a time period or a series of games.

It should be understood that, although the whole of the value of a prize awarded as a result of a game or game feature is generally subtracted from the accumulator associated with that game or game feature, the machine may be such that, under certain circumstances, for instance in the event of a high value prize being awarded, only a part of the value of the prize is subtracted from the accumulator associated with the winning game or game feature and the rest of the value of the prize is subtracted from one or more of the other accumulators. For example, if a £2 prize is awarded as a result of the nudge feature, £1 of this prize may be subtracted from the nudge accumulator and 50p may be subtracted from each of the jump accumulator and the hop accumulator, so as to ensure that the nudge feature will not be disabled for an excessively long period of time after the award of this high value prize.

CLAIMS

1. A gaming machine comprising game-playing apparatus, accumulator means for storing a current credit value associated with a game or game feature, pay-in means for monitoring the value of the pay-in and incrementing the current credit value in the accumulator mans by a predetermined proportion, but not the whole, of the pay-in value, pay-out means for awarding a prize in the event of a winning result to the game or game feature and for decrementing the current credit value in the accumulator means by at least part of the value of the prize awarded, and control means for controlling the game-playing apparatus in dependence on the current credit value in the accumulator means.

2. A gaming machine according to claim 1, wherein the accumulator means comprises a plurality of accumulators each of which stores a current credit value associated with a respective game or game feature, the pay-in means serving to increment the current credit values in the accumulators by predetermined proportions of the pay-in value such that the sum of the proportions allotted to the accumulators is less than the whole of the pay-in value, and the pay-out means serving to decrement the current credit value associated with the game or game feature in connection with which the prize is awarded by at least a part of the value of the prize awarded, and the control means is arranged to control the game-playing apparatus in dependence on the current credit values in the accumulators.

3. A gaming machine according to claim 1 or 2, wherein the control means enables a game feature to be awarded when the current credit value associated with that game feature is above a particular level, but prevents the feature from being awarded when the associated current credit value is below that level.

4. A gaming machine according to claim 3, wherein the control means enables a game feature to be awarded when the current credit value associated with that game feature is positive, but prevents the feature from being awarded when the associated current credit value is negative.

5. A gaming machine according to claim 3 or 4, wherein the control means is arranged to select a game feature which is available to be awarded on a random basis but with a particular chance of that feature being selected.

6. A gaming machine according to any preceding claim, wherein the control means is arranged to enter a low pay-out mode when the current credit value associated with the game falls below a particular level.

7. A gaming machine according to any preceding claim, wherein the or each predetermined proportion is stored in a memory and may be adjusted by operating switch means.

8. A gaming machine according to claim 7 when appended directly or indirectly to claim 2, wherein the switch means incorporates a plurality of switches each of which is provided for adjusting the proportion of the pay-in value to be allotted to an associated accumulator.

9. A gaming machine according to any preceding claim, being a fruit machine comprising a plurality of rotary or quasi-rotary members bearing symbols, or a plurality of display units adapted to display symbols and capable of being cycled to change the symbols displayed, a game-initiating switch which, when actuated by a player, causes the rotary members to be rotated or appear to rotate, or the display units to be cycled, before coming to rest with a combination of symbols in a viewing zone, the pay-out means being adapted to award a prize in the event of the resulting combination of symbols being a winning combination.

10. A gaming machine, being a fruit machine substantially as hereinbefore described with reference to the accompanying drawing.

Printed for Her Majesty's Stationery Office, by Croydon Printing Company Limited, Croydon, Surrey, 1982.
Published by The Patent Office, 25 Southampton Buildings, London, WC2A 1AY, from which copies may be obtained.